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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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GROUP 1700

Application Number: 10/719,585
Filing Date: November 21, 2003
Appellant(s): SIEVERS ET AL.

Wesley W. Whitmyer
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 17 September 2007 appealing from the Office action mailed 18 April 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,427,733	BENDA ET AL.	6-1995
DE 195 33 960	CELIKER, HERFURTH, and CELI	3-1997

Celiker, T., English translation of DE 195 33 960, "Method and Device to Produce Metallic Workpieces", 1997.*

* During prosecution, the DE 195 33 960 reference was referred to as "Herfurth" (See the English Abstract provided with the DE 195 33 960 document on 21 November 2003). Hereafter the reference to Celiker is referenced as "Herfurth".

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Claims 1, 2, 4, 5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benda (USPN 5427733) in view of Herfurth (DE 19533960, of record).

As to Claim 1, Benda teaches a method for producing a work piece by the successive compacting by electromagnetic radiation of powdered starting material in horizontal layers (3:66-4:40), each layer consisting of a horizontal surface and two substantially vertical lateral faces which form the basis for a possible subsequent layer (Fig. 2, Item 63 and 1:45-57). The part being surrounded by powder during fabrication would be an inherent aspect of the selective

laser sintering process taught by Benda. In the method of Benda, there is no teaching from the art that one should remove the powder between layers, and it would have been obvious to keep the powder in place to avoid the time wasted in removal of the powder. Benda is silent to the mechanical finishing aspects sought in the instant claims. However, they would have been prima facie obvious over Herfurth, who teaches intermediate mechanical finishing of the n^{th} layer after generation of the $n + x^{th}$ layer, and not being performed at the same time as mechanical finishing of the nth layer (Fig. 11, and 13:53-14:33). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Herfurth into that of Benda in order to save time by combining or simultaneously performing the compacting and milling steps, and to maintain an enlarged projecting edge to serve as a base for subsequent coating steps and retain heat. Additionally, rearrangement of process steps disclosed by the prior art is generally prima facie obvious in the absence of unexpected results. See MPEP 2144.04(IV)(C) and *Ex Parte Rubin*, 128 USPQ 440 (Bd. Pat. App. & Int. 1959).

As to Claims 2, 4, and 5, Herfurth's method fulfills the limitation of producing at least one further layer between the production of a layer and the mechanical finishing of it (Claim 2), several layers form a package (Claim 4), and mechanical finishing of a previous layer after the generation of the proceeding layer (Claim 5). **As to Claim 7**, Benda teaches providing at least one first horizontal layer of powdered starting material (1:54-65), compacting with a laser to form vertical lateral faces (1:66-2:23 and Fig. 2, Items 73 and 64), providing at least one second horizontal layer of powdered starting material (1:34-65, the process is repeated by Benda), and compacting with a laser to form a second trace with vertical faces (1:34-65 and Fig. 2, Items 73 and 64), the article remaining at all times surrounded by powder. In the method of Benda, there

is no teaching from the art that one should remove the powder between layers, and it would have been obvious to keep the powder in place to avoid the time wasted in removal of the powder. Benda is silent to the mechanically finishing. However, Herfurth teaches mechanically finishing vertical sidewalls of the first trace but not the sidewalls of the at least second trace, while the at least one first trace (Fig. 11, and 13:53-14:33). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Herfurth into that of Benda in order to save time by combining or simultaneously performing the compacting and milling steps, and to maintain an enlarged projecting edge to serve as a base for subsequent coating steps and to retain heat in the part. **As to Claim 8**, Benda teaches that the process of providing powdered material and compacting should continue repeatedly. In the method of Benda, there is no teaching from the art that one should remove the powder between layers, and it would have been obvious to keep the powder in place to avoid the time wasted in removal of the powder. Benda is silent to the mechanical finishing of the vertical sidewalls of the second trace. However, Herfurth teaches providing a third layer and finishing the vertical sidewalls of the second trace. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Herfurth into that of Benda in order to save time by combining or simultaneously performing the compacting and milling steps, and to maintain an enlarged projecting edge to serve as a base for subsequent coating steps and to retain heat in the part.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Benda (USPN 5427733) in view of Herfurth (DE 19533960, of record), and further in view of Prinz (5207371). Benda and Herfurth teach the subject matter of Claim 1 above under 35 USC 103(a).

As to Claim 3, Benda appears to be silent to the simultaneous finishing of several layers. However, Prinz teaches that multiple layers of a layered part can be milled simultaneously (Abstract). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Prinz into that of Benda in order to reduce the number of machining passes or to produce any desired configuration or contour (Prinz, 6:5-8) including undercuts and irregular shapes (Prinz, 3:30-31).

(10) Response to Argument

Argument 1

Appellants argue on pages 5-6 that there is no teaching that each layer be mechanically finished while the layer is still surrounded by powdered starting material. Appellants argue that "Clearly, such can not be disclosed by Benda, since Benda is silent to mechanical finishing." (Brief, page 6). Appellants further argue on pages 6-7 that Herfurth clearly and repeatedly teaches that powder that was not used should be removed between layers. Appellants therefore argue that it would not have been obvious to modify Benda with Herfurth to arrive at the claimed invention because Herfurth teaches away from the combination.

Response:

The Examiner responds that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). It is acknowledged by the Examiner and in the rejection that Benda is silent to finishing. This does not mean, however, that one of ordinary skill in the art practicing the method of Benda would somehow find it unobvious to also perform a finishing step on the resulting article. One would obviously be motivated to improve the appearance and surface finish of fabricated articles, and thus to incorporate a machining step into the method of Benda. Benda teaches a layer fabrication process, and Herfurth teaches a machining process specifically suggested and directed to be used to machine articles following a layer fabrication processes. Thus, there is ample motivation and suggestion to make the combination set forth above.

With regard to the arguments against the combination of certain aspects of the Herfurth process with the method of Benda, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Appellants assert that the machining process of Herfurth requires the use of a vacuum to remove powder, and that this vacuum would direct the ordinary artisan away from this combination. The Examiner respectfully disagrees with both assertions. The rejection and combination of references set forth above was <u>not</u> based upon bodily incorporation of the Herfurth process including all extraneous accessories and attachments, but instead that one would have been

motivated to incorporate the surface finishing process of Herfurth into the Benda process in order to improve surface appearance and finish.

With regard to Appellants' arguments that the use of a vacuum in the Herfurth references teaches away from this combination, it is noted that the use of a vacuum is merely one preferred embodiment. (Herfurth Translation, page 5, lines 6-7; page 7, paragraph 7; page 12, line 5). Notably, Herfurth teaches the blowing or vacuuming of powder as one aspect of the invention in dependent Claim 18, but does not provide this limitation in independent Claim 1. (Herfurth Translation, page 19). In doing so, Herfurth teaches or suggests that there are embodiments of the invention that do not use the vacuum and need not remove the powder using a blower or vacuum.

Therefore, in summary, there is ample motivation to provide a finishing process such as that of Herfurth with the process of Benda. Even if the embodiments of the Herfurth process which use a vacuum to remove powder are interpreted to teach away from the invention, this is merely one preferred embodiment which need not be taken as representative of the Herfurth process as a whole.

Argument 2

Appellants further argue on pages 7-8 that Appellants have invented a mechanical finishing tool having a configuration which allows it to produce acceptable results, while at the same time being very small in diameter (such as below 0.5 mm). Appellants further argue that using such a tool, and contrary to conventional wisdom, they have discovered that mechanical

finishing can be accomplished by dipping the tool into the powdered starting material to improve the efficiency of the finishing process. Appellants further acknowledge that although the tool developed by Appellant is not claimed in the present application, it explains how it was able to overcome the conventional wisdom that it is undesirable to mechanically finish a compacted layer while still surrounded with powder.

Response

The Examiner responds that these arguments should be given little weight because they are not commensurate with the scope of the claim, which requires no particular tool to perform the machining process. Appellants claim the machining process *generally*. Second, it is well established that the arguments of counsel cannot take the place of evidence in the record. M.P.E.P. § 716.01(c)(II) (citing *In re Schulze*, 145 USPQ 716, 718 (CCPA 1965)). Third, there appears to be no evidence in the record, including the specification, which supports these arguments or assertions of unexpected results. To be of any probative value, any objective evidence should be supported by actual proof. M.P.E.P. § 716.01(c)(I) (citing *In re De Blauwe*, 222 USPQ 191, 196 (Fed. Cir. 1984)). Here, there is no actual proof. Fourth, this claim fails the requirement that there must be a nexus between the merits of the invention and the secondary considerations. M.P.E.P. § 716.01(b) (citing *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 227 USPQ 657, 673-674 n. 42 (Fed. Cir. 1985)). In this case, not every mechanical tool or spinning speed would produce the abrasive effect asserted to be an improvement.

Argument 3

Appellants further acknowledge on pages 8-9 that while it is generally true that it is obvious to rearrange the order of steps disclosed by the prior art, this invention is not merely a rearrangement of steps because the prior art teaches away from the rearrangement of steps.

Response

Firstly, the Examiner respectfully disagrees that the prior art teaches away from this rearrangement of steps for the reasons discussed above relating to the Herfurth process. Secondly, it is unclear to the Examiner why this should be interpreted to be more than merely a rearrangement in the order of fabrication of layers and finishing, and therefore obvious in view of *Ex Parte Rubin*. Rubin is particularly relevant to the circumstances in this case because it involves only steps of assembly, lamination, or fabrication, and not steps of mixing ingredients or chemical reactions. Perhaps the instant invention is more accurately characterized as a combination of steps disclosed by the prior art (fabrication of layers and machining), rather than as a rearrangement of prior art process steps. However, the recognition that some amount of time could be saved by combining two manufacturing processes does not itself appear to be an unexpected benefit.

Argument 4

Appellants further argue on page 10 that Prinz does not disclose that which is asserted to be missing from the combination of Benda and Herfurth, and furthermore that Prinz does not use a powdered starting material surrounding any layer as it is being mechanically finished.

Response

The Examiner responds that Prinz teaches aspects of the machining process, and demonstrates additional teachings available to one of ordinary skill in the layer fabrication processes.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Matthew J. Daniels

Conferees:

Christina Johnson

/Romulo H. Delmendo/

Romulo H. Delmendo, Appeal Conferee